

Two new species of *Reductoniscus* Kesselyak, 1930 from New Guinea (Crustacea, Oniscidea, Armadillidae)

par

F. FERRARA * and S. TAITI *

With 3 figures

ABSTRACT

Two species of *Reductoniscus* Kesselyak, 1930 (Armadillidae), *R. novaehiberniae* and *R. pulcher*, from New Ireland (Papua New Guinea) are described as new. *R. costulatus* Kesselyak, 1930 is recorded from Singapore, Malaysia and the Hawaiian Islands. The composition of the genus is discussed. *R. gibbus* Lemos de Castro, 1972, *R. leleupi* Vandel, 1977, *R. mellissi* Vandel, 1977, *R. insularis* Vandel, 1977 and *R. watti* Vandel, 1977 are transferred to the genus *Pseudodiploexochus* Arcangeli, 1934. *Pseudodiploexochus leleupi* Taiti & Ferrara, 1979 is renamed *P. zairensis* nom. nov. as junior secondary homonym of *P. leleupi* (Vandel, 1977).

The genus *Reductoniscus* was established by KESSELYAK (1930) for the new species *R. costulatus* collected in greenhouses of the Botanical Garden in Berlin. In 1937 VERHOEFF described a second species of this genus, *R. fritschii*, also from Berlin (Aquarium). As already suspected by HOLTHUIS (1947) it is clear that *R. fritschii* is synonymous with *R. costulatus* (see also VANDEL, 1977a; 1977b).

Despite frequent records from European greenhouses (Paris, London, Baarn) for many years the origin of the species (and of the genus) remained unknown. LEMOS DE CASTRO (1972) described a second species (*R. gibbus*) from Brazil, and VANDEL (1977a) revised the genus including several species mostly from southern Africa (13 with certainty and 3 dubitatively) but without mentioning *R. gibbus*. A further species, *R. watti*, from Kermadec Archipelago was described by VANDEL (1977b).

As already discussed by TAITI & FERRARA (1979) and FERRARA & TAITI (1983), Vandel's definition of *Reductoniscus* is too comprehensive and all the species ascribed to

* Centro di Studio per la Faunistica ed Ecologia Tropicali del Consiglio Nazionale delle Ricerche, Via Romana 17, 50125 Firenze, Italy.

the genera *Pseudodiploexochus* Arcangeli, 1934 and *Myrmecodillo* Arcangeli, 1934 should be included in *Reductoniscus*.

FERRARA & TAITI (1983) compared *R. costulatus* with species of *Pseudodiploexochus*, and proved that the two genera are distinct. TAITI & FERRARA (1983) redefined *Myrmecodillo* after examination of the type species *M. hypselos* (Barnard, 1932) from Natal and *M. pollex* (Barnard, 1936) from Mauritius and Réunion, and this genus also appeared clearly different from *Reductoniscus* (and *Pseudodiploexochus*).

Reductoniscus is readily distinguished from all the other genera of Armadillidae in lacking the tergites of pleonites 1-2. It also differs from *Pseudodiploexochus* in the presence of a frontal groove which continues on the lateral margin of pereonite 1, and in having a simple and not a doubled lateral margin of the posterior pereonites and pleonites (see figs 123 and 128 in FERRARA & TAITI, 1983). These characters show that species of the two genera roll up into a ball in completely opposite ways, i.e. in *Reductoniscus* the posterior part of the body fits into the anterior one, while in *Pseudodiploexochus* the frontal shield and lateral margins of pereonite 1 fit into the posterior part of the body.

Reductoniscus is distinguished from *Myrmecodillo* by the different structures for rolling up on pereonites 1-3 (i.e. presence of a groove on lateral margins of pereonite 1 and absence of a tooth on ventral surface of epimera of pereonite 3). It also differs in the shape and position of the uropodal protopods which, in *Myrmecodillo*, are perpendicular to the telson so that their whole thickness fits the gap between the distal part of the telson and epimera of pleonite 5 (see TAITI & FERRARA, 1983: 224, fig. 14), while in *Reductoniscus* the uropodal protopods are parallel to the telson and their dorsal surface fits the gap.

In our opinion the genus *Reductoniscus* includes with certainty only the type species *R. costulatus*. All the other species ascribed to *Reductoniscus* by LEMOS DE CASTRO (1972) and VANDEL (1977a; 1977b) certainly belong to different genera, i.e. (* indicates species re-examined by us):

- a) *Armadillo pubescens* Budde-Lund, 1885 * and *Diploexochus conisaleus* Barnard, 1932 * to the genus *Sphaerillodillo* Arcangeli, 1934;
- b) *Diploexochus tabularis* Barnard, 1932 *, *D. ecaudatus* Barnard, 1932 *, *D. albanyensis* Barnard, 1932 *, *Armadillo silvivagans* Barnard, 1958, *Reductoniscus leleupi* Vandel, 1977 *¹, *R. mellissi* Vandel, 1977, *R. insularis* Vandel, 1977, *R. watti* Vandel, 1977 and *R. gibbus* Lemos de Castro, 1972 to *Pseudodiploexochus*;
- c) *Diploexochus hypselos* Barnard, 1932 * to *Myrmecodillo*;
- d) *Armadillo ausseli* Dollfus, 1893 * to *Tuberdillo* Arcangeli, 1941;
- e) *Reductoniscus laevis* and *R. lawrencei*, mentioned by VANDEL (1977a) but never described, are nomina nuda;
- f) *Diploexochus rhodesiensis* Barnard, 1932 (placed in the new genus *Pachydillo* by ARCANGELI, 1934) and *D. meiringi* Barnard, 1932 certainly do not belong to *Reductoniscus* and must be re-examined so that they may be ascribed to the correct genus.

Investigations carried out by the Centro di Studio per la Faunistica ed Ecologia Tropicali, Florence and the Muséum d'histoire naturelle, Geneva, in areas of the West Indian and Pacific Oceans revealed the presence of *R. costulatus* from various localities, and of two new species of *Reductoniscus* from New Ireland (Papua New Guinea). Their

¹ TAITI & FERRARA (1979) described *Pseudodiploexochus leleupi* from Zaire, which becomes junior secondary homonym of *P. leleupi* (Vandel, 1977). We propose to change the name of Taiti & Ferrara's species to *Pseudodiploexochus zairensis* nom. nov.

study permits confirmation of the diagnosis of *Reductoniscus* and its separation from closely related genera.

As is common for many armadillids, ornamentation is the best character to distinguish the species of the genus.

The material is deposited in the collections of the Bernice P. Bishop Museum, Honolulu (BPBM), the Muséum d'histoire naturelle, Geneva (MHNG) and the Museo Zoologico dell'Università, Florence (MF).

Genus *Reductoniscus* Kesselyak, 1930

Type species: *Reductoniscus costulatus* Kesselyak, 1930.

D i a g n o s i s . — Animals able to roll into a perfect ball. Dorsum with well developed ornamentation. Cephalon with a deep frontal groove and marginal line not interrupted. Pereonite 1 with lateral margin deeply grooved along its whole length; inner lobe of schisma clearly protruding backwards compared to outer one. Pereonite 2 with a conspicuous tooth on ventral surface of epimera, clearly visible also in lateral view. Pereonites 2-3 with triangular and 4-6 with quadrangular epimera. Lateral margin of pereonites 5-7 and pleonites 3-5 not thickened or grooved. Tergites of pleonites 1-2 absent. Telson with distal part short, rectangular. Antennae short and stout; second flagellar segment with a long and strong apical seta. Pereopods with a flagelliform dactylar seta. Exopods of pleopods with pseudotracheae; exopod of pleopod 1 absent. Uropod with distal part of protopod subrectangular with medial margin distinctly concave; exopod reduced, visible only on account of a long seta inserted at postero-medial corner.

Reductoniscus costulatus Kesselyak, 1930

Reductoniscus costulatus KESSELYAK 1930: 62, figs 17-23; WÄCHTLER 1937: 306, fig. 121; VERHOEFF 1937: 414; HOLTHUIS 1947: 132, figs 3-4; BOSCHMA 1950: 11; HOLTHUIS 1956: 225, fig. 77; VANDEL 1962: 854; GRUNER 1966: 326; SUTTON 1972: 104; VANDEL 1977a: 407; VANDEL 1977b: 47; FERRARA & TAITI 1983: 68, figs 119-125; TAITI & FERRARA 1983: 222.

Reductoniscus fritschii VERHOEFF 1937: 415, figs 1-12.

Reductoniscus fritschii WÄCHTLER 1937: 306, fig. 120.

M a t e r i a l examined. — SINGAPORE: 1 specimen, Woodlands, leg. V. Cottarelli, 18.X.1987, MF. MALAYSIA: 2 specimens, Selangor State, near Batu Caves, meadow, leg. S. Taiti, 26.X.1985, MF; 4 specimens, same data, 11.XI.1985, MF; 12 specimens, same locality, leg. S. Taiti & L. Bartolozzi, 11.XII.1987, MF. HAWAIIAN ISLANDS: 1 specimen, Oahu, Honolulu, garden of Bishop Museum, leg. S. Taiti, 28.XII.1984, MF; 68 specimens, Oahu, along Manoa Stream near University of Hawaii, leg. S. Taiti, 31.XII.1984, MF; 7 specimens, same data, BPBM; 7 specimens, same data, MHNG; 28 specimens, Oahu, Coconut Island, leg. S. Taiti, 5.I.1985, MF; 34 specimens, Hawaii, Kalapana, leg. S. Taiti, 8.I.1985, MF.

D i s t r i b u t i o n . — Greenhouses in Berlin (KESSELYAK 1930; VERHOEFF 1937), London (HOLTHUIS 1947), Baarn (BOSCHMA 1950; HOLTHUIS 1956) and Paris (VANDEL 1962). Seychelles: Mahé, Praslin (FERRARA & TAITI 1983; TAITI & FERRARA 1983); Silhouette, Curieuse (FERRARA & TAITI 1983); La Digue (TAITI & FERRARA 1983). Mauritius (TAITI & FERRARA 1983). Singapore. Malaysia. Hawaiian Islands: Oahu and Hawaii.

Remarks. — *R. costulatus* is characterized by its small size (about 2 mm), and number and disposition of dorsal costae and tubercles (see fig. 4 in HOLTHUIS 1947 and fig. 77 in HOLTHUIS 1956).

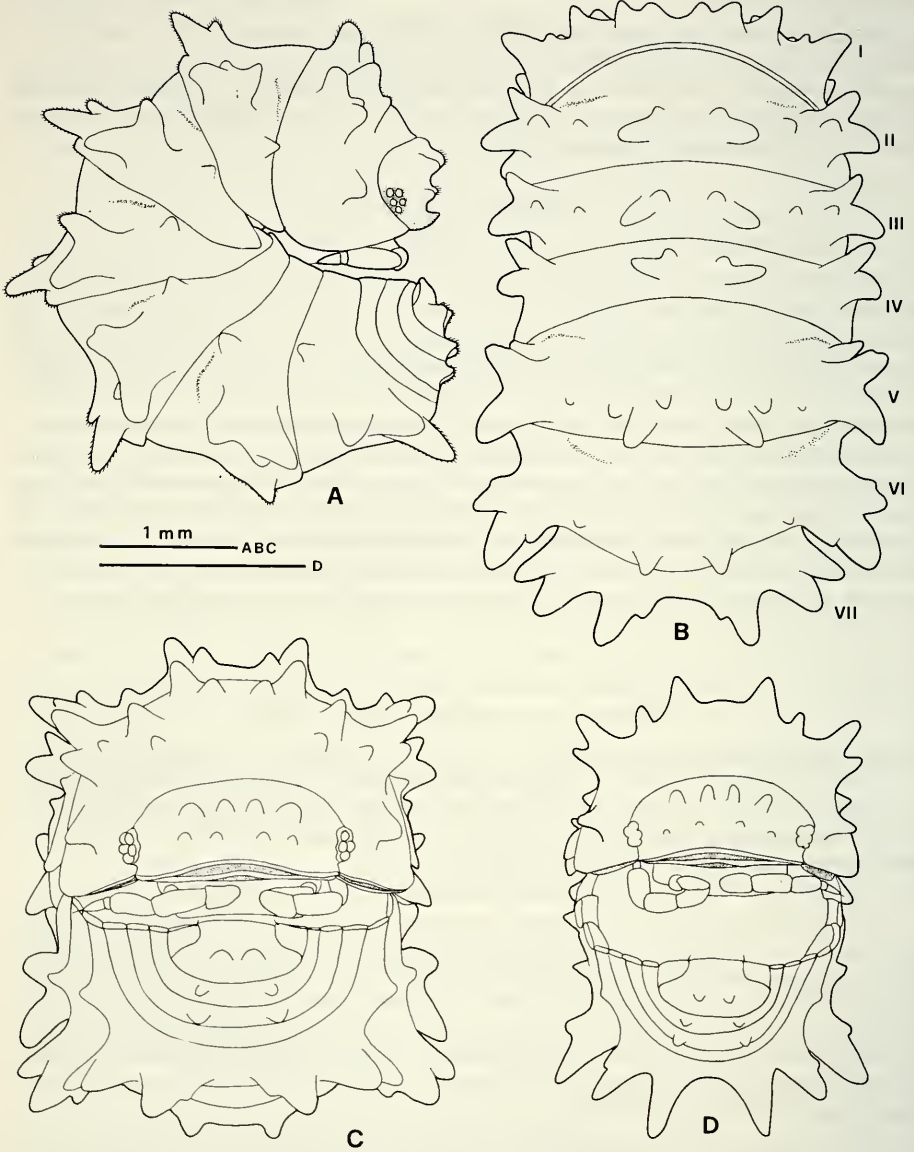


FIG. 1.

Reductoniscus novaehiberniae sp. nov.: A) holotype in lateral view; B) pereonites 1-7 in dorsal view; C) holotype rolled up showing cephalon, pereonite 1, pereonite 7, pleon and telson in dorsal view; D) juvenile specimen.

Reductoniscus novaehiberniae sp. nov.

Material examined. — PAPUA NEW GUINEA: 1♂ holotype, Nouvelle-Irlande, Lelet Plateau, 1 km de Limbin, grotte Perte de Dankobé, sur les parois, salle d'entrée, 1150 m, leg. J. D. Bourne, 26.VII.1979, MHNG; 1♀, 1 juv. paratypes, same data, MHNG; 1♀, 1 juv. paratypes, same data, MF; 1 juv. paratype, Nouvelle-Irlande, Lelet Plateau, Limbin, dans la jungle, tamisage de sol, 900 m, leg. J. D. Bourne, 25.VII.1979, MHNG; 1 juv. paratype, Nouvelle-Irlande, Lelet Plateau, près de Limbin, grotte Swalacdé, tamisage de sol à l'entrée, 1200 m environ, leg. J. D. Bourne, 25.VII.1979, MHNG.

Description. — Maximum size: 5.5×2.5 mm. Brown-grey. Eye globose with 5 large ommatidia. Dorsum with distinct ornamentation constituted by protruding tubercles arranged as in Fig. 1A-C. In juvenile specimens tubercles are proportionally more developed than in adults (Fig. 1D). Cephalon with frontal margin protruding above vertex; profrons with a triangular depression in the middle (Fig. 2A). Pereonite 1 with postero-lateral corner broadly rounded; inner lobe of schisma rounded, distinctly protruding backwards (Fig. 2B). Pereonite 2 with ventral tooth triangular, apically rounded (Fig. 2B). Telson about twice as wide as long, with distal margin slightly convex (Fig. 2C). Antenna with stout articles; second flagellar segment about twice as long as first (Fig. 2D). Uropodal protopod with excavated medial margin and a fringe of scales on posterior margin; endopod short, not reaching posterior margin of protopod, dorso-ventrally flattened; exopod indicated by a long seta at postero-medial corner of protopod, as in all the other species (Fig. 2E).

Male. Pereopod 7 with no apparent modifications (Fig. 2F). Pleopod 1 endopod with a small triangular hyaline lobe at apex (Fig. 2G). Pleopod 2 as in Fig. 2H.

Etymology. — The name refers to the latinisation of New Ireland where the specimens were collected.

Remarks. — *R. novaehiberniae* differs from *R. costulatus* in larger size, different shape and disposition of dorsal ornamentation and broader distal part of telson.

Reductoniscus pulcher sp. nov.

Material examined. — PAPUA NEW GUINEA: 1♂ holotype, Nouvelle-Irlande, Lelet Plateau, à 1 h 30 de marche de Limbin, tamisage sol de la jungle, 1200 m, leg. J. D. Bourne, 27.VII.1979, MHNG.

Description. — Size: 4×2 mm. Colourless with some brown spots on pereonites 5-7; brown antennae. Eye with 5 ommatidia. Dorsum with distinct ornamentation consisting of two protruding lateral plaques on pereonites and tubercles on cephalon, pereon, pleonites 4-5 and telson arranged as in Fig. 3A-C. Cephalon and pereonites 1-2 similar to the preceding species (Fig. 3D, E). Telson and uropods as in Fig. 3F.

Etymology. — Latin *pulcher* = beautiful. The name refers to the beautiful ornamentation of this species.

Remarks. — *R. pulcher* is easily distinguished from the other two species of the genus by its characteristic ornamentation.

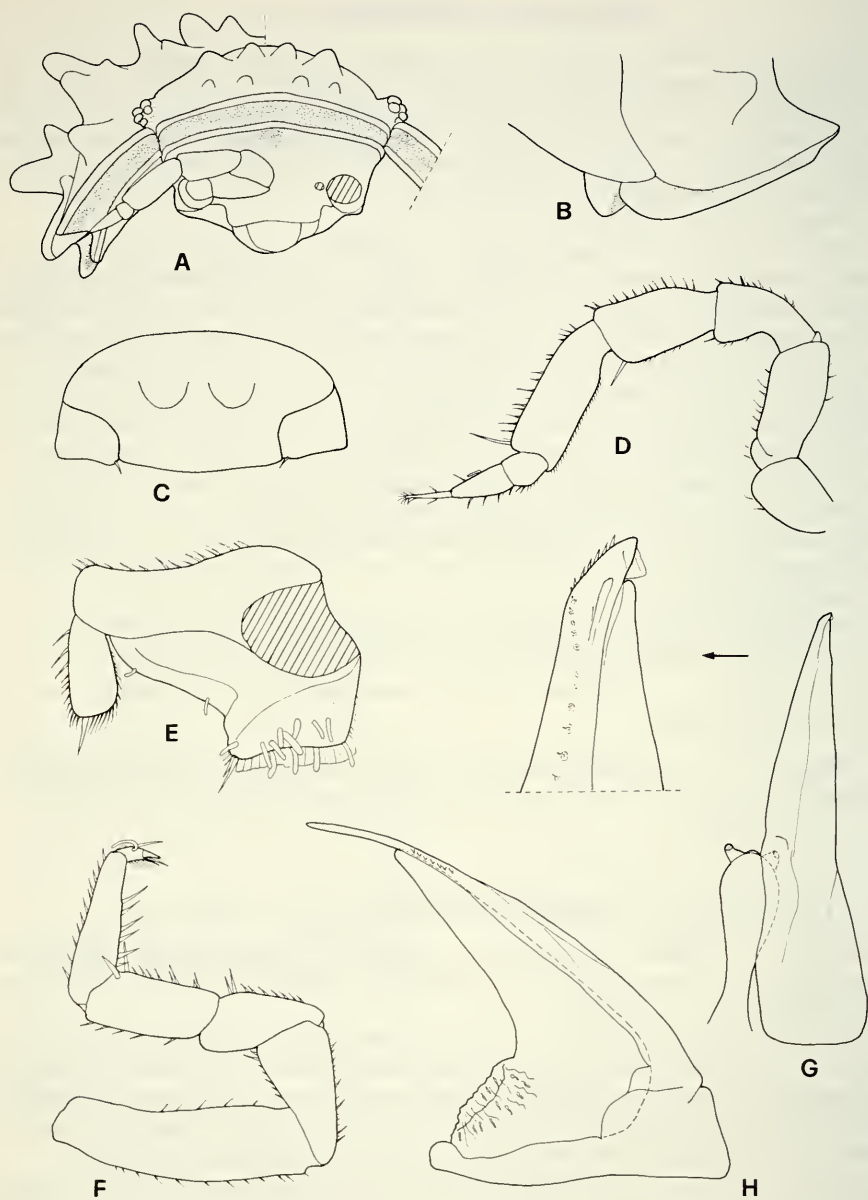


FIG. 2.

Reductoniscus novaehiberniae sp. nov., holotype: A) cephalon and pereonite 1 in frontal view; B) epimera of pereonites 1-2 in lateral view; C) telson and uropods; D) antenna; E) uropod; F) pereopod 7; G) pleopod 1 endopod and genital papilla; H) pleopod 2.

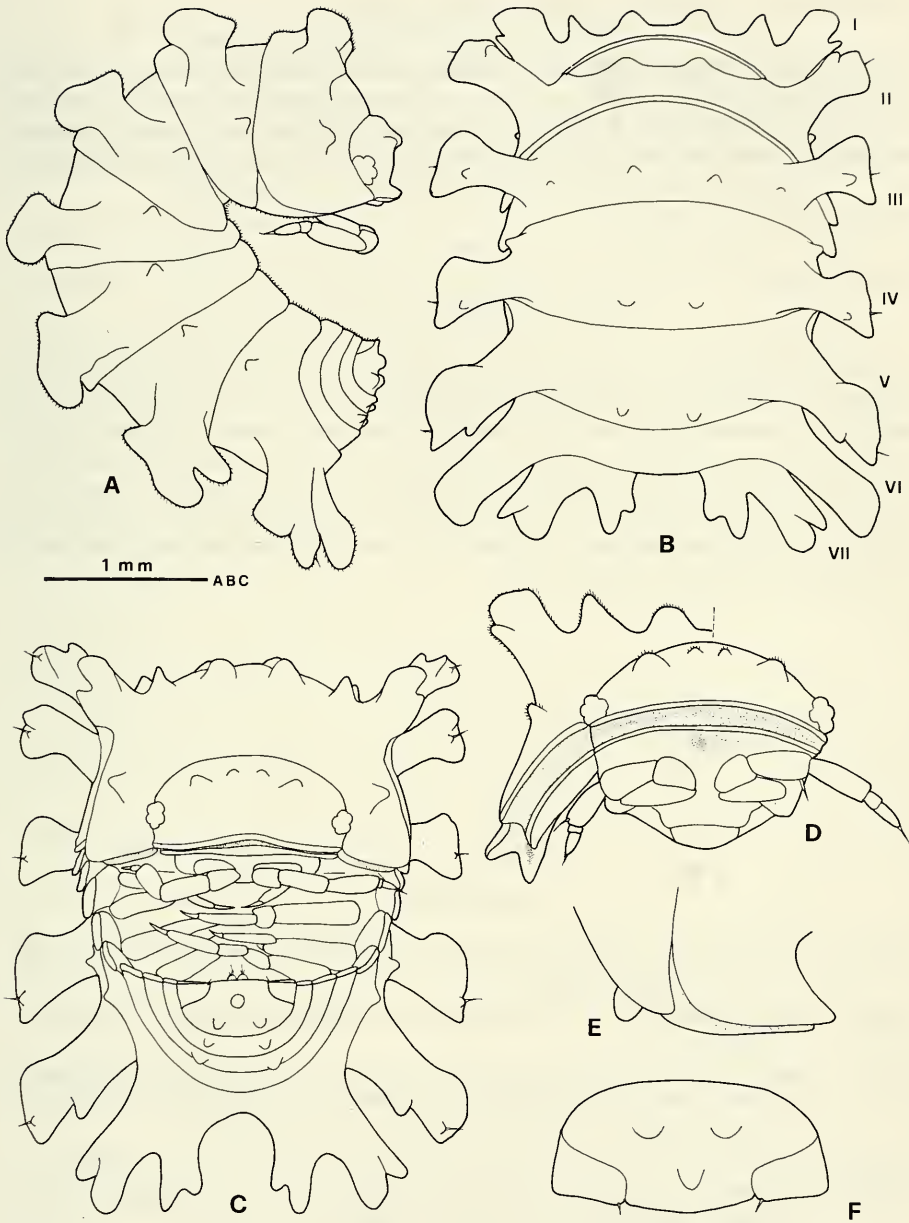


FIG. 3.

Reductoniscus pulcher sp. nov., holotype: A) lateral view; B) pereonites 1-7 in dorsal view; C) the animal rolled up showing cephalon, pereonite 1, pereonite 7, pleon and telson in dorsal view; D) cephalon and pereonite 1 in frontal view; E) epimera of pereonites 1-2 in lateral view; F) telson and uropods.

ACKNOWLEDGEMENTS

We wish to thank Dr. B. Hauser (Muséum d'histoire naturelle, Geneva) for the loan of material collected in New Ireland. We are particularly grateful to Drs F. G. Howarth and R. H. Titgen and Prof. E. S. Reese (Honolulu), and Prof. H. S. Yong (Kuala Lumpur) for their kind help and hospitality during S. Taiti's visits to Hawaii and Malaysia.

RÉSUMÉ

Deux nouvelles espèces de *Reductoniscus* Kesselyak, 1930 (Armadillidae), *R. novae-hiberniae* et *R. pulcher*, recueillies en Nouvelle-Irlande (Papouasie-Nouvelle-Guinée) sont décrites. *R. costulatus* Kesselyak, 1930 est citée de Singapour, Malaisie et Hawaï. La composition du genre est discutée. *R. gibbus* Lemos de Castro, 1972, *R. leleupi* Vandel, 1977, *R. mellissi* Vandel, 1977, *R. insularis* Vandel, 1977 et *R. watti* Vandel, 1977 sont transférés au genre *Pseudodiploexochus* Arcangeli, 1934. *Pseudodiploexochus leleupi* Taiti & Ferrara, 1979 est remplacé par *P. zairensis* nom. nov. en tant qu'homonyme secondaire plus récent de *P. leleupi* (Vandel, 1977).

REFERENCES

- ARCANGELI, A. 1934. Note di revisione sulla famiglia Armadillidae. *Boll. Musei Zool. Anat. comp. R. Univ. Torino* (3) 44: 83-119.
- BOSCHMA, H. 1950. Verslag omtrent het Rijksmuseum van Natuurlijke Historie te Leiden over het Jaar 1949: 1-27.
- FERRARA, F. & S. TAITI, 1983. Contributions à l'étude de la faune terrestre des îles granitiques de l'archipel des Séchelles (Mission P. L. G. Benoit-J. J. Van Mol 1972). Isopodi terrestri. *Annls Mus. r. Afr. cent.* Sér. 8vo (Sci. Zool.) 240: 1-92.
- GRUNER, H.-E. 1966. Krebstiere oder Crustacea. V. Isopoda. *Tierwelt Dtl.* 53 (2): 151-380.
- HOLTHUIS, L. B. 1947. On a small collection of Isopod Crustacea from the greenhouses of the Royal Botanic Gardens, Kew. *Ann. Mag. nat. Hist.* (11) 13: 122-137.
- 1956. Isopoda en Tanaidacea. *Fauna Ned.* 16: 1-280.
- KESSELYAK, A. 1930. Über Isopoden. *Zool. Anz.* 91: 50-66.
- LEMOS DE CASTRO, A. 1972. Considerações sobre o gênero *Reductoniscus*, com descrição de uma espécie nova (Isopoda, Oniscoidea). *Revsta bras. Biol.* 32: 347-349.
- SUTTON, S. L. 1972. Woodlice. *Ginn & Co. Ltd, London*, 144 pp.

- TAITI, S. & F. FERRARA, 1979. Il genere *Pseudodiploexochus* Arcangeli, 1934 (Armadillidae, Oniscoidea, Isopoda). *Revue Zool. afr.* 93: 151-184.
- 1983. Su alcuni Isopodi terrestri della Réunion, di Mauritius e delle Seychelles. *Revue suisse Zool.* 90: 199-231.
- VANDEL, A. 1962. Isopodes terrestres (Deuxième partie). *Faune Fr.* 66: 417-931.
- 1977a. La faune terrestre de l'île de Sainte-Hélène. Quatrième Partie. 1. Isopodes terrestres. *Annls Mus. r. Afr. cent. Sér.* 8vo (*Sci. Zool.*) 220: 385-426, pl. II.
- 1977b. Les Oniscoïdes (Isopodes terrestres) de la Nouvelle-Zélande et de l'Archipel Kermadec. *Mém. Mus. natn. Hist. nat., Paris (N.S.) (A, Zool.)* 102: 1-56.
- VERHOEFF, K. W. 1937. Über einige neue und bekannte Isopoda terrestria. 61. Isopoden-Aufsatz. *Sber. Ges. naturf. Freunde, Berlin* (1936): 411-430.
- WÄCHTLER, W. 1937. Ordnung: Isopoda, Asseln. *Tierwelt Mitteleur.* 2 (2b): 225-317, 2 pls.